

MEMS Shutter for Spectrometer Calibration

Completed Technology Project (2012 - 2012)



Project Introduction

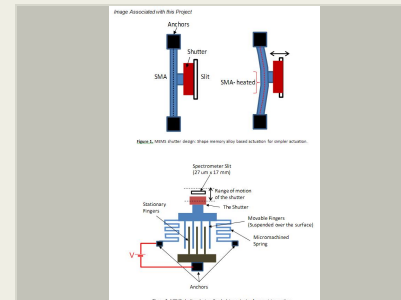
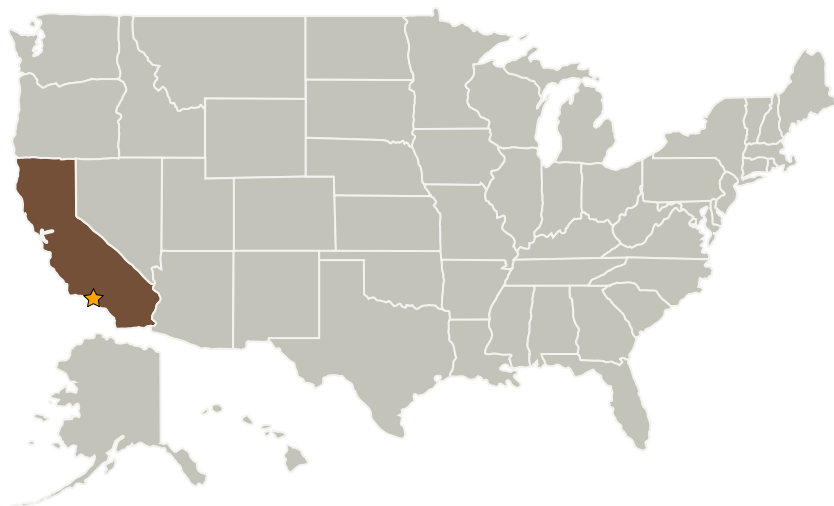
Dark field subtraction is a significant problem for all spaceborne spectrometer systems. An in-situ spectrometer relying on sunlight must either wait for night to collect dark frames, or must include a bulky mechanical shutter. To avoid bulky and power-hungry shutters, we propose to develop a MEMS shutter that is expected to have 2-3 g mass and consume

We shall develop a MEMS shutter that is expected to have 2-3 g mass and consume This research will demonstrate fabrication of a low mass ($\sim 2\text{-}3$ grams), low power (< 1 milliWatts), MEMS shutter. This technology will enable new in-situ and remote sensing imaging spectrometer instruments that were previously not feasible due to the mass, power, and reliability issues related to mechanical shutters or the calibration challenges posed by instruments without active dark frame measurement capability.

Anticipated Benefits

This shutter can be expected to become a standard feature in all spectrometers where mass, power, and reliability are a concern. All such systems will want to take advantage if it becomes available. Potential instruments and missions include Mars rovers and orbiters, asteroid missions, Europa, as well as Earth-orbiting and airborne spectrometers.

Primary U.S. Work Locations and Key Partners



Project Image MEMS Shutter for Spectrometer Calibration

Table of Contents

Project Introduction	1
Anticipated Benefits	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Images	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

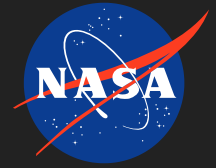
Jet Propulsion Laboratory (JPL)

Responsible Program:

Center Innovation Fund: JPL CIF

MEMS Shutter for Spectrometer Calibration

Completed Technology Project (2012 - 2012)

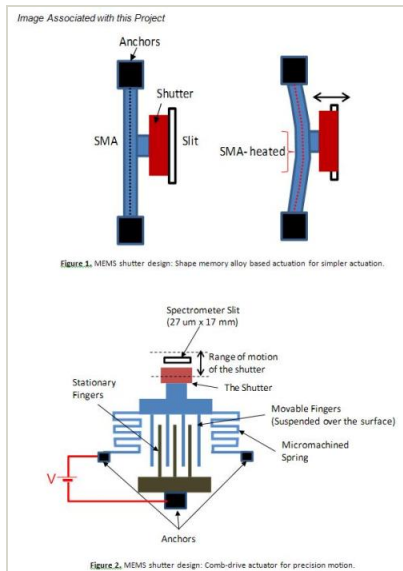


Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations

California

Images



74.jpg

Project Image MEMS Shutter for Spectrometer Calibration
(<https://techport.nasa.gov/image/1167>)

Project Management

Program Director:

Michael R Lapointe

Program Manager:

Fred Y Hadaegh

Project Manager:

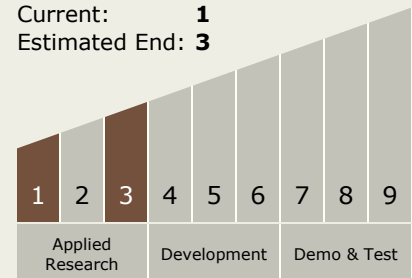
Jonas Zmuidzinis

Principal Investigator:

Byron E Van Gorp

Technology Maturity (TRL)

Start: **1**
Current: **1**
Estimated End: **3**



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - TX08.1 Remote Sensing Instruments/Sensors
 - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves